

《中文核心期刊要目总览》收录
Ei Compendex(核心版)收录
百种中国杰出学术期刊
RCCSE 中国权威学术期刊

2019.24(卷终)
第35卷 VOL. 35



ISSN 1002-6819
CN 11-2047/S
CODEN NGOXEO

农业工程学报

TRANSACTIONS OF THE CHINESE SOCIETY
OF AGRICULTURAL ENGINEERING

NONGYE
GONGCHENG
XUEBAO



ISSN 1002-6819



中国农业工程学会 主办

农 业 工 程 学 报

2019 年 12 月第 24 期（卷终） 总第 376 期（第 35 卷）

目 次

• 农业装备工程与机械化 •

后抛式免耕播种机碎秸装置离地高度自动控制系统研制

..... 吴惠昌, 胡志超, 吴 峰, 顾峰玮, 邱 添, 张延化, 陈有庆 (1)

间歇式自动取样条播排种器排种性能检测试验台研制

..... 卢彩云, 李洪文, 何 进, 王庆杰, 张宇帆, 黄圣海 (10)

育秧播种密度与取秧面积耦合对杂交稻机插质量和产量的影响

..... 李泽华, 马 旭, 陈林涛, 李宏伟, 黄益强, 黎俊荣, 罗国武, 姚俊豪 (20)

三节臂机载式疏花机的研制与试验 雷晓晖, 吕晓兰, 张美娜, 李 雪, 常有宏, Andreas. Herbst (31)

4CL-1 型自走式大葱联合收获机的研制 王方艳, 孙光全, 尚书旗 (39)

大蒜取种装置取种清种性能离散元模拟与试验 侯加林, 王后新, 牛子孺, 席 芮, 李天华 (48)

油菜机械移栽栽苗基质块力学与生物学特性分析 胡乔磊, 廖庆喜, 王 洋 (58)

基于 CFD 模拟的浓缩风能装置结构优化设计 姬忠涛, 田 德 (66)

• 农业水土工程 •

模袋混凝土衬砌梯形渠道冻胀适应性研究 姜宗科, 莫腾飞, 张晓红, 付小军, 何武全 (74)

电站尾水渠内鱼道进口位置布局 李广宁, 孙双科, 郝志红, 郭子琪, 柳海涛, 郑铁刚, 孙娟娟 (81)

东北典型区覆膜滴灌春玉米节水增产的光合生理响应

..... 王传娟, 张彦群, 王建东, 许 迪, 龚时宏, 吴忠东 (90)

适宜施氮钾水平提高滴灌秋茶的产量及品质 庞永磊, 王凤新, 黄泽军, 李 斌, 胡芳东, 夏英三 (98)

滴灌和微生物有机肥对设施土壤呼吸的耦合作用及机制

..... 侯毛毛, 陈竞楠, 林志远, 王晋伟, 李浩波, 陈锦涛, 翁郡灵, 吕祎文, 金 秋, 钟凤林 (104)

豆麦轮作区麦秸长期还田对作物产量及土壤化学性质的影响

..... 王秋菊, 姜 宇, 周 鑫, 米 刚, 刘 鑫, 李婧阳, 刘 峰, 中本和夫, 黄丹萍 (113)

长期保护性耕作对稻田土壤团聚体稳定性和碳氮含量的影响 王 兴, 祁剑英, 井震寰, 李 超, 张海林 (121)

考虑地表粗糙度改进水云模型反演西班牙农田地表土壤含水率 马 腾, 韩 玲, 刘全明 (129)

赣南崩岗的发育阶段及部位对土壤水力性质的影响 文 慧, 倪世民, 冯舒悦, 王军光, 蔡崇法 (136)

不同上方来水模式下工程堆积体坡面的植被调控

..... 姜永才, 高照良, 李永红, 齐星圆, 张 恒, 陈 卓, 苏 媛, 冯志倩 (144)

土壤复合侵蚀研究进展与展望 张 攀, 姚文艺, 刘国彬, 肖培青 (154)

• 农业信息与电气技术 •

中国农业信息化水平评价指标体系研究 沈剑波, 王应宽 (162)

基于自监督学习的番茄植株图像深度估计方法	周云成, 许童羽, 邓寒冰, 苗 腾, 吴 琼 (173)
基于 Wi-Fi 无线感知技术的猪呼吸频率监测	逯玉兰, 李 广, 郝玉胜, 林 强 (183)
耦合粘虫胁迫的玉米生长可视化模拟	唐丽玉, 韩 伟, 林 定, 陈崇成, 陈晓玲, 江 锋 (191)

• 农业生物环境与能源工程 •

基于 Ecotect 的不同墙体材料猪舍光热环境和热性能分析	袁月明, 宋 阳, 解晨辉, 周丽娜 (199)
极大硬毛藻无性系对海水养殖废水中氮盐的去除效果	李雪莹, 李 贤, 王金霞, 马晓娜, 周浩然, 徐建平, 刘 钦, 李 军 (206)
补光时间及光质对温室甜椒生长及产量品质的影响	段青青, 张禄祺, 张自坤, 王静静, 常培培, 张洪勇, 贺洪军 (213)
新疆农田残膜污染现状及防控策略	胡 灿, 王旭峰, 陈学庚, 汤修映, 赵 岩, 严昌荣 (223)
土壤重金属调查采样数目的确定方法研究进展	黄亚捷, 李菊梅, 马义兵 (235)
基于气液两相流的循环集热晒管传热特性分析	孙志林, 胡秋月, 涂文荣, 方诗标, 杨 洋 (246)

• 农业资源循环利用工程 •

硼泥对猪粪厌氧发酵重金属铬及其光谱特性的影响	李 轶, 宫兴隆, 于嘉琪, 郭敬阳, 曲壮壮, 张 镇, 易维明 (255)
NaOH 预处理提高甘蔗叶产甲烷性能及其机理分析	罗 娟, 赵立欣, 孟海波, 李秀金, 冯 晶, 袁海荣, 任雅薇, 于佳动, 黄开明 (262)

• 土地整理工程 •

长江经济带耕地集约利用多尺度时空特征与影响因素分析	张荣天, 陆建飞 (271)
基于“三生”适宜性的旅游度假区潜在土地利用冲突识别与治理	王建英, 邹利林, 李梅淦 (279)
煤矸石填充对沟道导排水性能和土壤肥力及重金属污染的影响	王忠波, 张金博, 王 斌, 李殿兴, 张兴义 (289)

• 农产品加工工程 •

装配式地下粮仓钢-混组合仓壁节点力学性能有限元分析	王振清, 揣 君, 王录民, 梁醒培, 刘永超, 侯支龙 (298)
基于改进 SSD 的柑橘实时分类检测	李善军, 胡定一, 高淑敏, 林家豪, 安小松, 朱 明 (307)
利用机器视觉与近红外光谱技术的皮蛋无损检测与分级	王巧华, 梅 璐, 马美湖, 高 升, 李庆旭 (314)
品种及含水率对谷子籽粒力学性质的影响	邱述金, 原向阳, 郭玉明, 崔清亮, 武新慧, 张志勇 (322)

Transactions
of the Chinese Society of Agricultural Engineering
Vol.35 No.24 Dec. 2019
CONTENTS

• Agricultural Equipment Engineering and Mechanization •

- Development of automatic control system for straw smashing height adjustment device of back throwing type no-tillage planter *Wu Huichang, Hu Zhichao, Wu Feng, Gu Fengwei, Qiu Tian, Zhang Yanhua, Chen Youqing* (1)
- Development of testbed for seed metering performance test of drill seeding device based on intermittent automatic sampling *Lu Caiyun, Li Hongwen, He Jin, Wang Qingjie, Zhang Yufan, Huang Shenghai* (10)
- Effects of coupling of nursing seedling densities and seedling fetching area on transplanting quality and yield of hybrid rice *Li Zehua, Ma Xu, Chen Lintao, Li Hongwei, Huang Yiqiang, Li Junrong, Luo Guowu, Yao Junhao* (20)
- Development and test of three arms tractor-mounted flower thinner *Lei Xiaohui, Lv Xiaolan, Zhang Meina, Li Xue, Chang Youhong, Andreas. Herbst* (31)
- Development of 4CL-1 self-propelled combine harvester for green onion *Wang Fangyan, Sun Guangquan, Shang Shuqi* (39)
- Discrete element simulation and experiment of picking and clearing performance of garlic seed-picking device *Hou Jialin, Wang Houxin, Niu Ziru, Xi Rui, Li Tianhua* (48)
- Mechanical and biological characteristics analysis of mechanically transplanted rapeseed substrate block seedlings *Hu Qiaolei, Liao Qingxi, Wang Yang* (58)
- Optimized structural design of concentrated wind energy device based on CFD numerical simulation *Ji Zhongtao, Tian De* (66)

• Soil and Water Engineering •

- Research on adaptability of using molded bagged concrete to ameliorate heave in trapezoidal concrete channel *Lou Zongke, Mo Tengfei, Zhang Xiaohong, Fu Xiaojun, He Wuquan* (74)
- Arrangement of fishway entrance in power station tailrace channel *Li Guangning, Sun Shuangke, Qie Zhihong, Guo Ziqi, Liu Haitao, Zheng Tiegang, Sun Juanjuan* (81)

Photosynthetic response of water-saving and yield-increasing of mulched drip irrigation for spring maize (<i>Zea mays</i> L.) in northeast China	<i>Wang Chuanjuan, Zhang Yanqun, Wang Jiandong, Xu Di, Gong Shihong, Wu Zhongdong</i> (90)
Improving yield and quality of autumn tea with drip irrigation under appropriate nitrogen and potassium fertilization	<i>Pang Yonglei, Wang Fengxin, Huang Zejun, Li Bin, Hu Fangdong, Xia Yingsan</i> (98)
Coupling effect and mechanism of drip irrigation and microbial organic fertilization on soil respiration in greenhouse	<i>Hou Maomao, Chen Jingnan, Lin Zhiyuan, Wang Jinwei, Li Haobo, Chen Jintao, Weng Junling, Lv Yiwen, Jin Qiu, Zhong Fenglin</i> (104)
Effects of long-term wheat straw returned to field on crop yield and soil chemical properties in soybean-wheat rotation areas	<i>Wang Qiuju, Jiang Yu, Zhou Xin, Mi Gang, Liu Xin, Li Jingyang, Liu Feng, Zhongben Hefu, Huang Danping</i> (113)
Effects of long-term conservation tillage on soil aggregate stability and carbon and nitrogen in paddy field	<i>Wang Xing, Qi Jianying, Jing Zhenhuan, Li Chao, Zhang Hailin</i> (121)
Inversion of surface soil moisture content of Spanish farmland using modified water cloud model	<i>Ma Teng, Han Ling, Liu Quanming</i> (129)
Effects of developmental stages and parts of collapsing gully on soil hydraulic properties in southern Jiangxi	<i>Wen Hui, Ni Shimin, Feng Shuyue, Wang Junguang, Cai Chongfa</i> (136)
Vegetation regulation on slopes of engineering accumulation under different upslope runoff patterns	<i>Lou Yongcai, Gao Zhaoliang, Li Yonghong, Qi Xingyuan, Zhang Heng, Chen Zhuo, Su Yuan, Feng Zhiqian</i> (144)
Research progress and prospects of complex soil erosion	<i>Zhang Pan, Yao Wenyi, Liu Guobin, Xiao Peiqing</i> (154)

• Agricultural Information and Electrical Technologies •

Investigation of evaluation index system for agricultural informatization level in China	<i>Shen Jianbo, Wang Yingkuan</i> (162)
Method for estimating the image depth of tomato plant based on self-supervised learning	<i>Zhou Yuncheng, Xu Tongyu, Deng Hanbing, Miao Teng, Wu Qiong</i> (173)
Monitoring pig respiration frequency using Wi-Fi wireless sensing technology	<i>Lu Yulan, Li Guang, Hao Yusheng, Lin Qiang</i> (183)
Visual simulation of maize growth responding to armyworm (<i>Mythimna separata</i>) attack	<i>Tang Liyu, Han Wei, Lin Ding, Chen Chongcheng, Chen Xiaoling, Jiang Feng</i> (191)

• Agricultural Bioenvironmental and Energy Engineering •

Analysis of light environment and thermal performance of piggery with different wall materials based on Ecotect

..... *Yuan Yueming, Song Yang, Xie Chenhui, Zhou Lina* (199)

Removal efficiency of nitrogen salts by *Chaetomorpha maxima* in aquacultural wastewater

..... *Li Xueying, Li Xian, Wang Jinxia, Ma Xiaona, Zhou Haoran, Xu Jianping, Liu Qin, Li Jun* (206)

Effects of spectrum and duration of supplemental illumination on growth, yield and fruit quality of greenhouse sweet pepper

..... *Duan Qingqing, Zhang Luqi, Zhang Zikun, Wang Jingjing, Chang Peipei, Zhang Hongyong, He Hongjun* (213)

Current situation and control strategies of residual film pollution in Xinjiang

..... *Hu Can, Wang Xufeng, Chen Xuegeng, Tang Xiuying, Zhao Yan, Yan Changrong* (223)

Research progress of methods for determining sampling numbers of soil heavy metals survey

..... *Huang Yajie, Li Jumei, Ma Yibing* (235)

Heat transfer characteristics in circulating solar heat tubes based on gas-liquid two-phase flow

..... *Sun Zhilin, Hu Qiuyue, Tu Wenrong, Fang Shibiao, Yang Yang* (246)

• Agricultural Resource Recycling Engineering •

Effects of boron mud on anaerobic fermentation of heavy metal chromium and its spectral characteristics in pig manure

..... *Li Yi, Gong Xinglong, Yu Jiaqi, Guo Jingyang, Qu Zhuangzhuang, Zhang Zhen, Yi Weiming* (255)

Improving methane production performance via NaOH pretreatment of sugarcane leaves and its mechanism analysis

..... *Luo Juan, Zhao Lixin, Meng Haibo, Li Xiuji, Feng Jing, Yuan Hairong, Ren Yawei, Yu Jiadong, Huang Kaiming* (262)

• Land Consolidation and Rehabilitation Engineering •

Multiscale spatiotemporal characteristics and influencing factors of intensive cultivated land use in Yangtze River Economic

Belt..... *Zhang Rongtian, Lu Jianfei* (271)

Identification and governance of potential land use conflicts in tourism resort based on ecological-production-living suitability

..... *Wang Jianying, Zou Lilin, Li Meigan* (279)

Effects of coal gangue filling on drainage performance, soil fertility and heavy metal pollution in erosion gully

..... *Wang Zhongbo, Zhang Jinbo, Wang Bin, Li Dianxing, Zhang Xingyi* (289)

• **Agricultural Produce Processing Engineering** •

Finite element analysis on mechanical properties of joint in precast steel plate-concrete composite wall of underground granary

..... *Wang Zhenqing, Chuai Jun, Wang Lumin, Liang Xingpei, Liu Yongchao, Hou Zhilong* (298)

Real-time classification and detection of citrus based on improved single short multibox detector

..... *Li Shanjun, Hu Dingyi, Gao Shumin, Lin Jiahao, An Xiaosong, Zhu Ming* (307)

Nondestructive testing and grading of preserved duck eggs based on machine vision and near-infrared spectroscopy

..... *Wang Qiaohua, Mei Lu, Ma Meihu, Gao Sheng, Li Qingxu* (314)

Effects of variety and moisture content on mechanical properties of millet

..... *Qiu Shujin, Yuan Xiangyang, Guo Yuming, Cui Qingliang, Wu Xinhui, Zhang Zhiyong* (322)